DOCUMENT RESUME

ED 441 549 JC 000 394

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TITLE The Economic Benefits of Sub-Baccalaureate Education: Results from the National Studies. CCRC Brief, Number 2.
INSTITUTION Columbia Univ., New York, NY. Teachers College.
SPONS AGENCY Alfred P. Sloan Foundation, New York, NY.
ISSN ISSN-1526-2049
PUB DATE 1999-06-00
NOTE 10p.; Based on a longer report entitled, "Learning and Earning in the Middle: The Economic Benefits of Sub-Baccalaureate Education."
AVAILABLE FROM Community College Research Center, Columbia University Teachers College, Box 174, 525 West 120th Street, New York NY 10027.
PUB TYPE Information Analyses (070)
EDRS PRICE MF01/PC01 Plus Postage.
DESCRIPTORS *Associate Degrees; *Credentials; *Education Work Relationship; Educational Benefits; Educational Status Comparison; *Employment Potential; *Postsecondary Education; Student Educational Objectives

ABSTRACT

While the economic benefits of the most familiar credentials--high school diplomas and baccalaureate degrees--are well established, the economic benefits are much less clear for other kinds of education and training. This report looks at the economic benefits of sub-baccalaureate education. While community colleges serve many goals and missions, their occupational purposes are central, and virtually all their students enroll to enhance their employment, either directly by completing an associate degree or by later transferring to a four-year college. Therefore, determining their employment effects is crucial to understanding what they accomplish. Issues in sub-baccalaureate education are examined: overall results of recent studies; the effects for minority, displaced, and older students; the effects of credentials by fields of study (certificates, associate degrees, and baccalaureate degrees); the effects of finding related employment; results by types of institutions; the issues of timing; effects on other dimensions of employment; and the reasons for returning to sub-baccalaureate education. There are clear and substantial returns to associate degrees. Labor market projections suggest that sub-baccalaureate education will continue to grow, though not as rapidly as baccalaureate and graduate education, as part of the longer-run process of educational inflation (or advancement) that has taken place throughout this century. It is likely that much of this growth will come from students who fail to complete either two- or four-year colleges, particularly if current patterns continue. (Contains 15 references.) (VWC)

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ED 441 549

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Results from National Studies

W. Norton Grubb

CCRC Brief
Number 2
June 1999

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COMMUNITY COLLEGE RESEARCH CENTER

CCRC BRIEF

NUMBER 2 JUNE 1999

The Economic Benefits of Sub-Baccalaureate Education: Results From National Studies

W. Norton Grubb

Despite the important intellectual and political purposes of formal schooling, its economic value has come to be central. In fall 1993, a record 75 percent of college freshmen cited vocational reasons for attending college, up from 50 percent in 1971 (Higher Education Research Institute, 1994). Indeed, the rhetoric of human capital—of investing in education for the economic benefits it will generate in the future—dominates state and national policy and has led to an unquestioning acceptance of all schooling and training as routes to individual and collective advancement. However, while the economic benefits of the most familiar credentials—the high school diploma, the baccalaureate degree, and various professional degrees—are well established, the economic benefits are much less clear for other kinds of education and training.

This report focuses on the economic benefits of sub-baccalaureate education. While community colleges serve many goals and missions, their occupational purposes are central, and virtually all their students enroll to enhance their employment, either directly or by later transferring to four-year colleges. Therefore, determining their employment effects is crucial to understanding what they accomplish.

The Issues in Sub-Baccalaureate Education

Sub-baccalaureate education has grown substantially. Thirty years ago only 13 percent of the labor force had "some college"; currently about 27 percent of the labor force have more than a high school diploma but less than a baccalaureate degree. Forecasts of the nation's occupations suggest that this trend will continue: the occupations with the highest growth rates include health technicians, technicians and related support occupations, marketing and sales, and some administrative occupations, including computer operators—all of which typically require some education beyond high school but less than a baccalaureate degree (Silvestri, 1993, Tables 1 and 2). Even if occupational forecasting is a risky business, the educational level of the labor force is almost certain to continue increasing—and much of the growth will take place at the sub-baccalaureate level.

During this period of growth, the simple economic benefits of sub-baccalaureate education increased. During the 1960s, those with some college earned a little less than high school graduates. Today, compared to high school graduates, men with some college earn 14 percent more and women with some college earn 17 percent more. However, those with "some college" are a heterogeneous group. Some have completed credentials, particularly two-year Associate degrees and one-year certificates; smaller numbers have received occupational licenses of various kinds. Many have entered two- and four-year colleges and then left, with amounts of postsecondary education ranging from a course or two to nearly a baccalaureate degree. Overall, non-completion from both two- and four-year colleges has increased since the mid-1970s (Grubb, 1989; Boesel & Fredland, 1998, Figure 3). Dropout rates are particularly high from community colleges and less selective four-year colleges, and among low-income and minority students. Therefore, it is particularly important to determine the economic consequences of leaving postsecondary institutions without credentials.

The high levels of non-completion in community colleges have generated different interpretations. One is that it reflects some way in which the college has failed—though in the case of community colleges external pressures (the lack of financial support, the demands of employment and family life) are surely responsible for a great deal of dropping out. But community college students often leave when they have completed enough coursework for their purposes; for example, some of these "dropouts" may have passed licensing exams necessary for their jobs. Over the past decade, credentials offered by private groups have proliferated, and students earning such credentials only *appear* to be dropouts because they have not completed publicly recognized credentials.

A different perspective is offered by Manski (1989), who notes that the community college is a low-cost

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way of finding out about postsecondary education; these "experimenters" may drop out if they find college not to their advantage. This perspective indicates that many students in postsecondary education—and certainly many non-traditional and older students attending community college—are not the well-informed consumers often assumed in state and federal policy, but are searching for information through the very process of attending college. Clearly, the reasons for non-completion are complex and difficult to disentangle.

Another complication is that the types of institutions providing sub-baccalaureate education vary substantially. There are two-year technical institutes that offer credentials in occupational subjects only, vocational schools that provide short programs and certificates for adults, and a variety of proprietary schools that offer postsecondary occupational education, ranging from the excellent—in well-known institutions like the Culinary Institute of America and the various DeVry Institutes—to the fraudulent. Unfortunately, few data sources can disentangle the different types of postsecondary institutions. It is important to remember that the variations in quality that might lead to higher and lower economic benefits are simply averaged, describing an overall effect that is not especially meaningful for any particular institution.

Several special characteristics of the sub-baccalaureate labor market distinguish it from the market for those with baccalaureate and graduate degrees:

- The market appears to be quite local. Employers looking to fill occupations requiring less than a baccalaureate degree report that they search locally. Two-year colleges target local employers, and students search for employment almost entirely within the local community.
- Hiring practices for sub-baccalaureate jobs tend to be informal, with few performance-oriented tests or absolute education requirements. Specific experience is usually preferred to formal schooling, and preparation in the military, on the job, and through hobbies may be as valuable as formal schooling.
- Employers are likely to lay off less-educated workers before well-educated employees. Individuals with sub-baccalaureate education are more likely than those with baccalaureate degrees (though less likely than high school graduates) to suffer unemployment over the business cycle.

Several well-known statistical problems in examining wages, earnings, and other employment effects make it difficult to determine the economic value of education. Because postsecondary institutions differ substantially in their quality and selectivity, students vary in their high school grades and other academic qualifications, family backgrounds, and purposes and ambitions; those entering occupational programs differ from those enrolling in academic programs for the purpose of transferring to four-year colleges. Similarly, measures of ability have long been recognized as critical to disentangling the direct effects of formal schooling from the effects of ability.

In addition to observable factors like academic achievement, family background, and ability, some analysts have tried to control for self-selection into various institutions. There is evidence that community college students choose these institutions when they are unsure of their ability to make their way in four-year universities, and when they feel unable to leave home. Indeed, some observers have argued that most students attending two-year colleges would not attend postsecondary education at all if community colleges were not accessible. This issue relates to important decisions about statistical analysis. If community college students would otherwise have attended four-year colleges, then community colleges reduce their eventual education attainment. But if students entering community colleges would otherwise not have progressed beyond high school, then the relevant comparison is between the effects of a high school diploma and those of various amounts of community college education.

A final problem is that the benefits of postsecondary education may not materialize until individuals reach their late twenties or early thirties. Since earnings for different education groups do not begin to diverge until after age 30, examining wages and earnings soon after students leave postsecondary education may not capture those significant differentials. This is a special problem with data sets based on young cohorts.

Results

The early results about sub-baccalaureate education were generally drawn from special-purpose data, usually based on individuals in specific institutions and collected by follow-up questionnaires, often with low response rates. Beginning in the 1970s, several national data sets became available with greater detail about education. Unfortunately, many of these relied on limited data of uncertain generalizability, were poorly controlled, and failed to distinguish carefully among high school graduates, completers of different types of postsecondary programs, and non-completers, and most of them compared attendance at community colleges to four-year colleges. These results, therefore, tell us little about whether community college attendance and completion enhance

employment and earnings over those of high school graduates.

Recent Studies: Overall Results

Recent data sets have improved the ability of researchers to examine the sub-baccalaureate labor market. These include three longitudinal data sets: the National Longitudinal Survey of the Class of 1972 (NLS72); the High School and Beyond Study of the classes of 1980 and 1982; the National Longitudinal Survey of Youth (NLS-Y), which followed a group of individuals who would have graduated from high school between 1976 and 1983. The Survey of Income and Program Participation (SIPP) has the advantage over these data sets of describing the entire population, rather than a single cohort or a young sample, and has been carried out every year since 1984; however, it is limited as a longitudinal survey since each group is followed for only 28 or 32 months. The National Survey of Adult Literacy (NALS) interviewed a random sample of the population in 1992; while its major purposes were to ascertain literacy practices and measure levels of literacy, it also collected data on employment. The Current Population Survey added a question about certificates and Associate degrees in 1992, allowing for some detail within the "some college" group.

These studies indicate extensive variation in the estimated returns to schooling, even for something as basic and apparently well understood as the value of a baccalaureate degree. Despite the variation, the returns to the baccalaureate are higher for earnings than for wage rates, indicating that completing the baccalaureate affects the amount of employment in addition to the wage rate.

With some exceptions, the results clarify that completing Associate degrees enhances wages, employment, and earnings by significant amounts. Men with Associate degrees earn 18 percent more, and women 23 percent more, than high school graduates.

Few data sets include information about certificate programs. While some studies suggest a zero return to a certificate for both men and women, other data show significant returns, though they appear to be declining for men (Grubb, 1997). Unfortunately, the results on certificates are likely to be flawed by a lack of information about the credentials that may matter the most. Many occupational areas require licenses; if community college students enroll long enough to earn such credentials and then leave for employment, they show up in national data sets as non-completers. Given the apparent increase in these credentials, this is an important problem with current results.

For those who complete some college but earn no credential, the results vary, partly because different data sets provide varying amounts of information. Small amounts of postsecondary education do benefit some individuals, but these benefits are quite small—substantially lower than for Associate degrees and probably depend precisely on the individual's courses.

Do small numbers of credits—those accumulated by students who attend casually, for two or three courses—have any benefit? From most of the NLS-Youth findings, it seems that 30 credits—approximately one year's worth of full-time enrollment—is a basic minimum needed to confer an economic benefit. Unfortunately, many community college students receive less than 30 credits (colleges identify such students as "uncommitted" or "experimenters"). The benefits of 12 credits in community college range from zero or insignificant, particularly for those earning academic credits, to a high of 4.7 percent for men and 4.8 percent for women (Surette, 1999). Therefore, the benefits of 12 credits or less are generally not high enough to be of any importance, and are often negligible. However, it is important to remember that these results are averages, and other sources of variation—fields of study, relation to employment, and receipt of licenses and "private" credentials—could affect them substantially.

In sum, there are clear and substantial returns to Associate degrees. There is greater uncertainty about the benefits of certificates, perhaps because of missing information about licenses and other credentials. The benefits to completing some coursework in either two- or four-year colleges are smaller—in the range of 5 to 10 percent—and students need to complete one or two years of coursework to derive this benefit. For students who are uncommitted or experimenters, the employment benefits are trivial. Consistently, women have higher returns than do men, and their returns are higher for earnings than for wages. Roughly, then, more formal schooling is better than less: a baccalaureate degree is superior to an Associate degree, which in turn is better than taking some coursework without completing credentials.

The Effects for Minority, Displaced, and Older Students

Given their low costs, lack of admissions requirements, and their claims to being "people's colleges," community colleges have become the postsecondary institutions that certain disadvantaged groups use to gain access to employment. A reasonable question, then, is whether the economic benefits to these groups are substantial, or whether they are lower than they are for non-disadvantaged groups.

A disproportionate number of black and Hispanic students enroll in postsecondary education through

community colleges. Relatively few national analyses have distinguished these groups; however, the NLS-Youth data indicate a relatively consistent pattern: the returns to baccalaureate degrees are generally higher for black men and women compared to whites, as are the returns to Associate degrees. Most comparisons for those not completing credentials favor blacks, and the consistency of the effects perhaps compensates for the lack of statistical significance. Based on these few results, attending a community college probably confers greater advantages to blacks than to whites, compared to remaining a high school graduate, even though some of the differences are small and uncertain.

However, given such findings, it is important to remember that completion rates are lower for black and Hispanic students compared to whites, and therefore they are less likely to complete the Associate degree or to transfer to four-year colleges. In Averett and D'Allesandro's results (forthcoming), blacks entering community colleges are much less likely to complete baccalaureate degrees and slightly less likely to complete Associate degrees than are whites; therefore, the slightly higher returns for blacks are undermined by lower completion rates.

Another group in community colleges of particular interest are older students who return to college to upgrade their employment, or to change their occupations when the sector they are in collapses. In addition, the pressure to move individuals off welfare has led some older welfare recipients to community colleges, sometimes in regular programs and sometimes in programs specially devised for them. The obvious question is whether the employment effects of sub-baccalaureate education, and particularly community colleges, is the same for older individuals and displaced workers as it is for younger students of conventional college age.

Jacobson, LaLonde, and Sullivan (1997) found that displaced workers in community college programs suffered an earnings loss compared to comparison groups between $146 and $293 per credit, a substantial amount given that those enrolled completed 26 to 30 credits. Thereafter, earnings increased steadily though slightly. However, this overall effect masked substantial differences among fields of study, with substantial positive returns to health-related credits, science and math, and trades and repair, while basic or remedial education and the humanities had negative effects. If, for example, an individual took one year's worth of health-related and technical credits, the long-run increase in earnings would be about 15 percent.

Leigh and Gill (1997), using NLS-Youth data results up to the 1993 survey when individuals were age 28 to 35, found that the value of attending a community college without receiving a credential was higher for older men than for younger men, suggesting that older men are more likely to enroll for specific employment-related purposes. Effects for those earning Associate degrees were insignificant, and were negative for those with baccalaureate degrees. A similar study by Grubb (1995b) found that those receiving credentials after age 30 did not have statistically different returns from those earning credentials between age 24 and 30. Overall, these results indicate that returns to sub-baccalaureate education do not decline for older students and are actually higher for some groups, though there isn't any consensus about precisely which older groups benefit most from formal schooling.

The Effects of Credentials by Fields of Study

Despite problems with small samples in certain occupational areas, some clear patterns emerge.

Certificates. For men, there are higher returns to engineering, computer, and health-related certificates but much lower returns for business and miscellaneous vocational subjects. For women, health-related certificates have significant returns but the business and vocational/technical subjects do not. At this level, "business" programs are often preparing secretaries and data-entry clerks, so it is not surprising to find low returns.

Associate degrees. The effects of Associate degrees are somewhat clearer because sample sizes are larger. For men, the returns are highest in engineering and computer fields. For women, business and health-related occupations have positive returns, while others do not; in vocational/technical fields (which include low-paid cosmetology programs) and in education (largely child care) the coefficients are negative though insignificant. Evidently, because of the substantial gender segregation at this level of the labor market, the results are substantially different for men and women except in business. Therefore, efforts to move women into non-traditional occupations need not only to persuade women to enroll in the appropriate educational programs, but must also change the employment patterns that deny women returns equivalent to those of men.

Baccalaureate degrees. The highest returns are in business, engineering/computers, health, and math/science; returns are lower in social sciences (at least for men) and the humanities, and lower still in education. These results are more consistent between men and women than are the results for Associate degrees—perhaps a reflection that patterns of gender segregation are more powerful in sub-baccalaureate occupations than they are in occupations for which a baccalaureate degree is common.

Finally, the returns to Associate degrees and to baccalaureate degrees overlap. For example, men can earn more by getting an Associate degree in engineering, public service, or vocational/technical subjects than they can from a baccalaureate in the humanities or education; women can earn more with an Associate degree in business or health than with a baccalaureate in vocational/technical subjects, the humanities, or education. This overlap underlies the recent phenomenon of "reverse transfer," where students who already have baccalaureate degrees return to community colleges for vocational programs—presumably those with degrees in low-paying fields like the humanities returning for credentials in well-paid health and technical fields. However, it is important to realize that such claims depend on the *overlap* in the distribution of benefits, while, on *average,* baccalaureate degrees are still more valuable than Associate degrees.

It matters a great deal what field of study an individual chooses. For some students, non-economic benefits may be important; some may want to go into child care or home health care for altruistic reasons or may view these as appropriate careers in early stages of their work life. But it is unclear whether students are making well-informed choices among the occupational alternatives. Given numerous complaints about the lack of guidance and counseling in both high schools and community colleges, it is likely that some students enter some programs without understanding that the economic returns are not substantial.

The Effects of Finding Related Employment

For vocational and professional programs, which are relatively job-specific, the economic benefits of postsecondary education may depend on whether an individual finds employment related to his or her education. The only national study of related and unrelated employment is my analysis of SIPP data (Grubb, 1997). Disentangling the effects of related and unrelated employment requires a definition of which occupations are matched to particular fields of study. Using a relatively simple matching procedure, I linked the 19 fields of study in the SIPP data with Census occupation codes. For individuals with baccalaureate degrees, roughly 60 percent in occupational areas have related employment. For those with Associate degrees, the proportion of related employment is lower than 60 percent for men but higher for women—due to especially high rates of related employment in business and in health occupations, which tend to be dominated by women. The extent of relatedness among individuals with certificates hovers around 55 percent. Among individuals with some college but without a credential, men with more years of postsecondary education are more likely to find related employment, while the patterns for women are erratic.

Consistently, the returns to related employment are higher than the returns to unrelated employment, confirming the hypothesis that the job-specific nature of vocational education reduces its value in unrelated jobs. In a few cases—the baccalaureate, and the Associate degree for men—the value of even an unrelated degree is positive and significant (even though substantially lower than the value of a related degree), suggesting that these degrees have some general components that enhance productivity and earnings even in occupations unrelated to the field of the credential. However, in the majority of cases, and particularly for women, the coefficient for related employment is significant, but for unrelated employment it is not. Individuals with credentials have higher rates of related employment than those with small amounts of college—so part of the higher economic benefits of completing coherent programs is due to the advantage that provides in finding employment related to one's field of study.

Based on these results, the best course for a student is to complete an occupational credential and find related employment. An academic degree is second-best—both at the baccalaureate level and the Associate level, where the returns to academic Associate degrees are substantial but less than those to related occupational credentials. And the least beneficial course is to complete an occupational degree but then fail to find related employment. These patterns are roughly the same for individuals with postsecondary education who fail to complete credentials: related postsecondary schooling provides some advantages, but unrelated schooling does not, and the benefits of uncompleted academic programs are highly variable (Grubb, 1997).

Overall, these results confirm that completing credentials and coursework is necessary but not sufficient to realize economic benefits; placement in a related occupation is crucial to realizing the potential benefits of occupational education. While community colleges do have mechanisms to link their programs to employers, in many cases these mechanisms are weak. This finding helps explain the variation in returns to different fields of study, since some fields—business and health occupations, for example—have higher rates of related employment than do others. For educational institutions and policy-makers, these results confirm the value of efforts to link programs to employers and to help students find jobs related to their programs of study.

Results by Types of Institutions

In most national studies, individuals are asked how much education they have received, but not where

they received it; they are also asked if they received "vocational training," but without any further definition. As a result, preparation from community colleges, technical colleges and institutes, area vocational schools, proprietary schools, and short-term job training programs are all lumped together even though these vary substantially in their intensity, duration, and quality of training. This lack of detail may bias downward the estimated effects of some postsecondary education, particularly if individuals answering these questions lump short-term training with education. The SIPP data try to distinguish education from training—and the effects of training on earnings are uniformly negative (Grubb, 1995b).

Only when data include transcripts has it been possible to distinguish types of institutions. In their analysis of the NLS72 data, Kane and Rouse (1995) found credits from "vocational schools," including both private and public technical institutes, to have negative though insignificant effects for men, while vocational credits from community colleges had positive and significant effects. Credits from private two-year colleges appeared to confer greater economic benefits, for both men and women, than those from public community colleges, though these differences were not significant. My own analysis of these data (Grubb, 1995a) indicated that vocational credits from community colleges had higher effects for men than those from public technical institutes or proprietary schools, while proprietary school credits may have been more valuable for women. But many of these results were statistically insignificant, perhaps because of small sample sizes.

The Issues of Timing

Conventional age-earnings profiles indicate that the benefits of postsecondary education may not materialize until individuals are in their late 20s or early 30s. Klerman and Karoly clarified that it may take some time to find an "adult" job—defined as one lasting either one, two, or three years—after the process of milling around often characterizing youth unemployment. Only 50 percent of men with baccalaureate degrees were in an adult job (defined as one lasting two years) three years after leaving college, while comparable figures were roughly 30 percent for those with some college and high school diplomas and slightly less than 20 percent for high school dropouts (Klerman & Karoly, 1994, Chart 3). Since the period of "settling in" can be quite long, examining economic effects at young ages may understate the eventual value of postsecondary education.

However, at least two studies suggest that economic benefits may materialize relatively early. The NLS-Youth data indicate that differentials associated with education emerge as early as age 23 (Surette, 1997), though these differentials continue to increase steadily with age. The earnings differences are much larger for those completing Associate and baccalaureate degrees than they are for men with some college but without credentials. Using the SIPP data, I estimate that the returns to Associate degrees and certificates are, if anything, higher for the younger cohorts, not older cohorts (Grubb, 1995b).

The issue of timing, therefore, merits further analysis. While some results indicate that earnings differentials associated with postsecondary education emerge relatively quickly after students leave formal schooling, others suggest that such benefits take a while to materialize. It is at the very least prudent to be careful about any employment effects measured shortly after students leave college since these may describe the period of "settling in" and thereby understate the longer-run value of postsecondary education. In turn, such patterns might affect enrollments if potential students focus on earnings right after completing education rather than over a lifetime.

Effects on Other Dimensions of Employment

Most analyses of the effects of education have concentrated on either wages or earnings. Of course, there are other employment and non-employment effects of formal schooling, some of which are instrumental to earning more over the long run and some of which are valuable in their own right. For example, the results from SIPP data indicate that postsecondary education has a substantial effect on the kinds of occupations individuals find. Overall, postsecondary education reduces the likelihood of working in relatively unskilled sales, clerical, and service positions, and as operatives and mechanics, and increases the probability of working in professional, managerial, and technical positions with higher pay and better prospects for advancement. An additional value of earning a vocational certificate or Associate degree is that it reduces the amount of time involuntarily unemployed. The stability of employment, measured by the month-to-month variation in earnings over the year, is also greater for those with baccalaureate and Associate degrees and vocational certificates.

Similarly, Surette (1997) found a significant effect of both two-year and four-year college credits on the probability of employment for young men, though completing an Associate or baccalaureate degree did not significantly improve the likelihood of employment further. Sub-baccalaureate education did not affect the annual hours worked, but completing a baccalaureate degree did. However, the finding that economic returns are generally higher for earnings

than for hourly wages confirms the effect of additional school on employment.

Explaining the Returns to Sub-baccalaureate Education

Finally, there remains the extremely difficult problem of explaining why sub-baccalaureate education leads to better employment and higher earnings—particularly when there is some evidence that at this level of the labor market few employers require certificates or Associate degrees and often prefer experience over formal schooling. One possibility is that postsecondary education signals ability and motivation—that is, individuals with greater ability and motivation attend postsecondary education, compared with those who are content with high school diplomas, and employers hire for these dimensions rather than for the competencies acquired in formal schooling.

Self-selection may also explain the results; that is, individuals who enroll in postsecondary programs are those who know they can benefit, but other high school graduates (or older workers without credentials) would not. Although self-selection is difficult to examine, Surette (1997) found that returns are always higher when corrected for self-selection—indeed, more than twice as high for the Associate degree. The implication is that, while the economic benefits of two-year colleges are substantial, they would be even larger if we could consider certain unobserved variables, including those that cause students to choose community colleges over other educational paths. However, there is not enough data about self-selection to come to any certain conclusions.

Institutional connections may also be responsible for the returns to postsecondary education. Some employers, impressed with local community college programs, try to hire from them even when community college education is not a requirement, or establish working relationships with them, granting their students access to employment in return for having some say over the content of the educational program. In still other cases, co-op and work experience programs establish clear mechanisms for entry into middle-skill occupations.

In sum, there are numerous aspects of the specific causal mechanisms by which sub-baccalaureate education affects employment that have not yet been extensively investigated—partly because doing so is notoriously difficult. However, for students, administrators, and policy-makers, this greater detail may be necessary in order to make their plans, improve their programs, and decide which kinds of postsecondary education to support.

Summary and Conclusion

The information about sub-baccalaureate education has improved considerably over the past five years. Virtually all the national results rely on research conducted since the early 1990s. With improved information, some of the debates about community colleges and other sub-baccalaureate postsecondary institutions can be put to rest. Evidently, the critics of community colleges are incorrect in their wholesale condemnation of these institutions: They do allow individuals to advance into "better" jobs—more stable, more likely to be professional or managerial, and of higher status. They also increase earnings, certainly for those who complete Associate degrees, and (in many cases) for those who complete certificates or the equivalent (one year of credits, for example). Moreover, the benefits appear to hold up for groups of special concern—blacks, older individuals, displaced workers—and the returns are generally slightly higher for women than for men.

However, postsecondary education does not improve employment under all conditions. The returns to postsecondary education for those who fail to complete credentials is small and uncertain. Some such individuals appear to benefit, perhaps older and experienced students, but in other cases the additional earnings are insignificant or trivial. Further, very small amounts of postsecondary education—those taken by "uncommitted" students or "experimenters"—provide little economic benefit. Therefore there is reason for continued concern about the low completion rates in community colleges and other postsecondary institutions.

Finally, some occupational fields have much higher returns than others, while the value of certain occupational fields (like education and agriculture) and of academic subjects for those who do not transfer to four-year colleges is low and uncertain. Finding employment related to a student's field of study is critical to realizing the benefits of many occupational programs, so that placement may be necessary in addition to education itself.

What about the future? Labor market projections suggest that sub-baccalaureate education will continue growing, though not as rapidly as baccalaureate and graduate education, as part of the longer-run process of educational inflation (or advancement) that has taken place throughout this century. It is likely that much of this growth will come from students who fail to complete either two- or four-year colleges, particularly if current patterns continue.

Information about effectiveness provides a way of understanding what is happening in our postsecondary institutions, of identifying the successes as well as the problems to be remedied. If funding patterns,

institutional incentives, or student behavior is inappropriate—that is, if they contribute to reduced completion, or lower the economic benefits, or make it difficult for students to realize their goals—then data about economic outcomes can reveal these problems and prompt state and federal policymakers and local administrators to take steps to resolve them. Such use of data is part of making institutions self-conscious about their effectiveness and becoming self-reforming institutions. The highest hope is that a better understanding of the economic effects of sub-baccalaureate education will, in the long run, help enhance them. ✣

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This Brief was developed at the Community College Research Center, Teachers College, Columbia University. It was drawn from a longer report entitled, *Learning and Earning in the Middle: The Economic Benefits of Sub-Baccalaureate Education,* which may be ordered from CCRC. The research was conducted with support from the Alfred P. Sloan Foundation.

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